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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,183	03/24/2005	Mitsumasa Kondo	268535US0PCT	1877
22850 7590 07/30/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER HON, SOW FUN	
			ART UNIT 1772	PAPER NUMBER
			NOTIFICATION DATE 07/30/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/529,183	Applicant(s) KONDO ET AL.	
	Examiner Sow-Fun Hon	Art Unit 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Objection Repeated

1. The objection to the abstract is repeated for the same reason previously of record in the Office action dated 01/30/07.

Rejections Repeated

2. The 35 U.S.C. 102(b) rejection of claims 1-3 as being anticipated by Kawata, is repeated for the same reasons previously of record in the Office action dated 01/30/07.

New Rejections

Claim Rejections - 35 USC § 112

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 9 recites "a C₆₋₂₀ alkyl group, a cycloalkyl group or a fluoroalkyl group is at the N-position of the carbazole structure" in claim 5. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 13 recites the limitation "the diamine having an alkyl group, a fluoroalkyl group, a steroid skeleton or a combination thereof in its side chain " in claim 5. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 14 recites the limitation "the formula (II)" in claim 5. There is insufficient antecedent basis for this limitation in the claim. It is suggested that Applicant change dependency from claim 5 to claim 7.

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6. Claim 15 recites the limitation "the formula (II)" in claim 5. There is insufficient antecedent basis for this limitation in the claim. Furthermore, it is noted that the formula (II) recited in claim 7, requires that R be a tetravalent group having an alicyclic structure, which means that claim 15 is only further limiting of R for those Markush group species having an alicyclic structure, but contains other species which do not have an alicyclic structure.

Claim Rejections - 35 USC § 102

7. Claims 1, 5, 10-13, 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Itsuo (JPO Website Machine English Translation of JP 06-202118).

Regarding claim 1, Itsuo teaches a liquid crystal alignment treating agent used to obtain an alignment film (by rubbing treatment (liquid crystal orientation film obtained through rubbing processing, [0007]), comprising: at least one polymer selected from the group consisting of (i) a polyamic acid (polyimide precursor, [0011]) obtained by reacting one or more tetracarboxylic dianhydrides with one or more diamines (or mixture of, [0011]) comprising at least one diamine having a structure represented by Applicant's formula (I), wherein X is a hydrogen atom (2,7-diaminocarbazole [0013]), and (ii) a polyimide obtained by the cyclodehydration of such a polyamic acid (polyimide system orientation film, [0015]).

It is noted that the recitation of "to obtain an alignment film for nematic liquid crystal by rubbing treatment after forming a coating film" is a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural

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difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, Itsuo teaches the claimed structural formula of the polymer liquid crystal alignment treating agent, which is thus expected to be capable of being made into an alignment film for nematic liquid crystal by rubbing treatment after forming a coated film. See MPEP 2111.02.

Regarding claims 5, 10, Itsuo teaches a rubbed liquid crystal alignment film (liquid crystal orientation film is obtained through rubbing processing, [0007]) comprising: at least one polymer selected from the group consisting of (i) the polyamic acid (polyimide precursor, [0011]) obtained by reacting one or more tetracarboxylic dianhydrides with one or more diamines (or mixture of, [0011]) comprising at least one diamine having a structure represented by Applicant's formula (I), wherein X is a hydrogen atom (2,7-diaminocarbazole [0013]), and (ii) a polyimide obtained by the cyclodehydration of such a polyamic acid (polyimide system orientation film, [0015]).

It is noted that the recitation of "capable of aligning nematic liquid crystal" is a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, Itsuo teaches the claimed structure of the rubbed polymer liquid crystal alignment film, which is thus expected to be capable of aligning nematic liquid crystal. See MPEP 2111.02.

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Regarding claim 11, Itsuo teaches that the diamine of Applicant's formula (I) is combined with an aromatic diamine, alicyclic diamine, a silicon diamine (disiloxane, [0012]), aliphatic diamine ([0014]) and mixtures thereof ([0011]).

Regarding claim 12, Itsuo teaches that the diamine of Applicant's formula (I) is combined with a diamine selected from the group consisting of p-phenylenediamine, m-phenylenediamine, 4,4'-diaminobiphenyl, diaminodiphenylether, diaminodiphenylsulfone, diaminobenzophenone, diaminonaphthalene, 2, 2-bis-[4-(4-aminophenoxy)phenyl]propane, 2,2-bis[4-(4-aminophenoxy)phenyl]hexafluoropropane (2, and 2-)[4 and - (4-amino phenoxy) phenyl] propane; 2 and 2-screw [4-(4-amino phenoxy)phenyl]hexaFURORopropane, [0012]), and mixtures thereof ([0011]).

Regarding claim 13, Itsuo teaches that the diamine is selected from the group consisting of a diamine having an alkyl group in its side chain, namely 2, 2-bis-[4-(4-aminophenoxy)phenyl]propane (2, and 2-)[4 and - (4-amino phenoxy) phenyl] propane, [012]), and a fluoroalkyl group in its side chain, namely 2,2-bis[4-(4-aminophenoxy)phenyl]hexafluoropropane (2 and 2-screw [4-(4-amino phenoxy)phenyl]hexaFURORopropane, [0012]), and mixtures thereof ([0011]).

Regarding claim 15, Itsuo teaches that the tetracarboxylic dianhydrides can be pyromellitic acid, 1,2,5,6-naphthalene tetracarboxylic dianhydride, 2,3,6,7-naphthelane dicarboxylic acid, 3,3',4,4'-benzophenone tetracarboxylic acid and mixtures thereof ([0011]).

8. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Shunsuke (JPO Website Machine English Translation of JP 09-080440).

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Regarding claims 1-2, Shusuke teaches a liquid crystal alignment treating agent to obtain an alignment film (liquid crystal orientation agent which forms the liquid crystal orientation film, [0034]) for nematic liquid crystal (pneumatic mold liquid crystal, TN liquid crystal cell [0045]), comprising: at least one polymer selected from the group consisting of (i) a polyamic acid obtained by reacting one tetracarboxylic dianhydride with a diamine ([0018]) comprising at least one diamine that is 3,6-diaminocarbazole ([0010]), having a structure represented by the formula (I) of Applicant, where X is a hydrogen atom, and (ii) a polyimide obtained by cyclodehydration of such a polyamic acid (imide-izing under existence of a dehydrating agent, [0018]).

Although Shunsuke fails to teach that the liquid crystal alignment treating agent is given rubbing treatment after forming a coating film, the recitation of "to obtain an alignment film for nematic liquid crystal by rubbing treatment after forming a coating film" is one of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, Itsuo teaches the claimed liquid crystal alignment treating agent and that it forms a coating film that aligns nematic liquid crystal as described above. Thus the liquid crystal alignment treating agent is expected to be capable of being given rubbing treatment after forming a coating film. See MPEP 2111.02.

Regarding claim 3, Shunsuke teaches that the one or more tetracarboxylic dianhydrides are one or more tetracarboxylic dianhydrides comprising at least one

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tetracarboxylic dianhydride represented by formula (II) of Applicant wherein R is a tetravalent organic group having an alicyclic structure (1,2,3,4-cyclobutane tetracarboxylic acid, 1,2,3,4-cyclopentane tetracarboxylic acid [0012], combining two or more [0014]).

Claim Rejections - 35 USC § 103

9. Claims 4, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itsuo as applied to claims 1,5,10-13, 15 above, and further in view of Matsuo (US 3,994,567).

Itsuo teaches a liquid crystal alignment treating agent used to obtain an alignment film by rubbing treatment after forming a coating film, comprising: at least one polymer selected from the group consisting of (i) a polyamic acid obtained by reacting one or more tetracarboxylic dianhydrides with one or more diamines comprising at least one diamine having a structure represented by Applicant's formula (I), and (ii) a polyimide obtained by cyclodehydration of said polyamic acid, as discussed above.

Regarding claim 4, Itsuo teaches a liquid crystal display device ([0001]) obtained by applying the liquid crystal alignment treating agent described above, to a pair of substrates (applied to homogeneity with the means of a spin coat in an electrode surface, [0007], using these two substrates, [0021]) having electrodes (electrode substrate of the pair, [0016]), to form coating films, rubbing the coating film surfaces to form liquid crystal alignment films (substrate equipped with the orientation film is obtained through rubbing processing, [0007]), and sandwiching liquid crystal between

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the liquid crystal alignment films formed on the pair of substrates (the liquid crystal cell was assembled using these two substrates, aforementioned liquid crystal constituent was enclosed within this cell, [0021]). Itsuo fails to teach that the liquid crystal is nematic.

However, Matsuo teaches a liquid crystal display device (column 14, lines 45-60) obtained by applying a liquid crystal alignment treating agent to a pair of substrates having electrodes, to form coating films (pair of electrode base plates, immersed in solution, polyimide film formed on one surface of each plate, column 12, lines 1-10), rubbing the coating film surfaces (each of these plates was orientated by rubbing it in one direction, column 12, lines 10-15) to form liquid crystal alignment films (column 2, lines 33-37), and a nematic liquid crystal is then sandwiched between the liquid crystal alignment films formed on the pair of substrates (the two electrode base plates, column 14, lines 45-60), for the purpose of providing the desired dielectric anisotropy required for the operation of display device (column 7, lines 10-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a nematic liquid crystal as the liquid crystal in the liquid crystal display device of Itsuo, in order to provide the desired dielectric anisotropy required for the operation of the display device, as taught by Matsuo.

Regarding claim 17, Itsuo fails to teach that the rubbed liquid crystal alignment film has a thickness of from 5 to 300 nm.

However, Matsuo teaches that the rubbed liquid crystal alignment film (polyimide, column 5, lines 19-20, orientation processing by rubbing, column 5, lines 26-30, liquid

crystal alignment, column 2, lines 33-36) can have a thickness of from 10 nm to 5000 nm, which contains the claimed range of from 5 to 300 nm, for the purpose of providing the desired balance of orientation power, uniformity of coating and electrical response (0.01 micron, to 5 microns, column 5, lines 19-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have given the rubbed liquid crystal alignment film of Itsuo, a thickness within the range of 5 to 300 nm, in order to provide the liquid crystal display with the desired balance of orientation power, uniformity of coating and electrical response, as taught by Matsuo.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo (US 3,994,567) in view of Itsuo (JPO Website Machine English Translation of JP 06-202118).

Matsuo teaches a liquid crystal display device comprising a pair of substrates having electrodes (pair of electrode base plates, column 14, lines 45-60), a rubbed liquid crystal alignment film on each of the substrates (their respective polyimide resin films on their inner sides in mutually facing state and with the orientated direction, column 14, lines 50-60, each of these plates was orientated by rubbing it in one direction, column 12, lines 10-15, to form liquid crystal alignment films, column 2, lines 33-37), and a nematic liquid crystal sandwiched between the rubbed liquid crystal alignment films (the two electrode base plates, column 14, lines 45-60). Matsuo teaches that the rubbed liquid crystal alignment film (column 5, lines 25-29) is capable of aligning the nematic liquid crystal (alignment of ample strength, abstract). Matsuo

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teaches that the rubbed liquid crystal alignment film comprises at least one polymer selected from the group consisting of (i) a polyamic acid obtained by reacting one tetracarboxylic dianhydride (carboxylic acid anhydride, column 4, lines 30-34, pyromellitic anhydride, 2,3,6,7-naphthalenetetracarboxylic anhydride, column 4, lines 62-64) with one diamine (column 4, lines 30-34), and (ii) a polyimide obtained by cyclodehydration of said polyamic acid (dehydration and ring closure, column 4, lines 15-26). Matsuo teaches that the diamine has a structure such as that of m-phenylene diamine and p-phenylene diamine (column 4, lines 45-46), but fails to teach that the diamine comprises one with a structure represented by Applicant's formula (I).

However, Itsuo teaches a rubbed liquid crystal alignment film (liquid crystal orientation film is obtained through rubbing processing, [0007]) comprising: at least one polymer selected from the group consisting of (i) a polyamic acid (polyimide precursor, [0011]) obtained by reacting one or more tetracarboxylic dianhydrides with one or more diamines (or mixture of, [0011]) comprising at least one diamine having a structure represented by Applicant's formula (I), wherein X is a hydrogen atom (2,7-diaminocarbazole [0013]), and (ii) a polyimide obtained by the cyclodehydration of such a polyamic acid (polyimide system orientation film, [0015]). Itsuo teaches that the diamine can be part of a mixture with m-phenylene diamine and/or p-phenylene diamine ([0012], and mixtures thereof ([0011]), for the purpose of providing the desired combination of physical properties imparted by the specific diamines.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have combined a diamine having a structure

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represented by Applicant's formula (I) with the diamine to form the polymer in the rubbed liquid crystal alignment film of Matsuo, in order to provide the desired combination of physical properties imparted by the specific diamines, as taught by Itsuo.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itsuo as applied to claims 1,5,10-13, 15 above, and further in view of Nakayama (US 5,414,126).

Itsuo teaches a rubbed liquid crystal alignment film comprising: at least one polymer selected from the group consisting of (i) a polyamic acid obtained by reacting one or more tetracarboxylic dianhydrides with one or more diamines comprising at least one diamine having a structure represented by Applicant's formula (I), and (ii) a polyimide obtained by cyclodehydration of said polyamic acid, wherein the rubbed liquid crystal alignment film is capable of aligning a nematic liquid crystal, as discussed above. Itsuo fails to teach that the rubbed liquid crystal alignment film further comprises a silane-coupling agent.

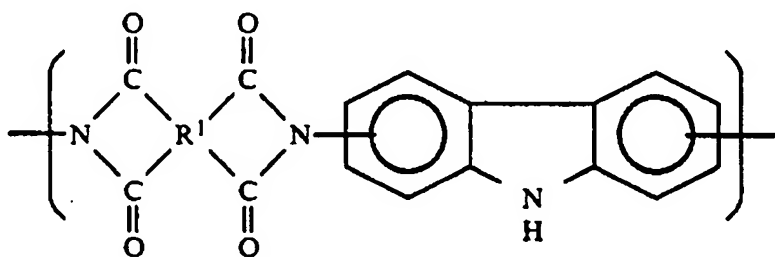
However, Nakayama teaches that a polymer film can further comprise a silane-coupling agent for the purpose of increasing the adhesivity of the film to the substrate (column 18, lines 32-40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added a silane coupling agent to the rubbed liquid crystal alignment film of Itsuo, in order to increase the adhesivity of the rubbed liquid crystal alignment film to the substrate, as taught by Nakayama.

12. Claims 5-7, 10-15, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawada (US 5,158,619) in view of Maas (US 3,554,744).

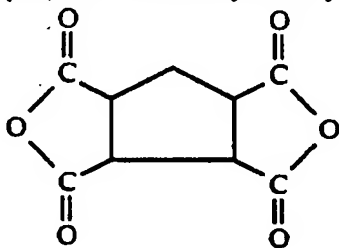
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Regarding claims 5, 7, Kawada teaches a polymer which is a polyimide obtained by cyclodehydration of a polyamic acid (dehydrating to cause ring closure, column 4, lines 60-63), obtained by reacting one tetracarboxylic dianhydride with diaminocarbazole (column 4, lines 64-65), which is a diamine with the structure represented by formula (I) of Applicant, seen as the reacted component on the right hand side of the repeat unit of the polyamic acid of Kawada, shown below, wherein X of Applicant = hydrogen atom, and Y¹ of Applicant = Y² of Applicant = primary amino group.



Kawada teaches that the tetracarboxylic dianhydride is represented by formula (II) of Applicant, wherein R of Applicant is a tetravalent organic compound having an alicyclic structure (Example 7, cyclopentanetetracarboxylic anhydride, column 7, lines 50-65, shown on the next page).

7. Cyclopentanetetracarboxylic anhydride



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Kawada teaches that the polymer is made into a photoconductive film (column 1, lines 5-10), but fails to teach that the film is rubbed.

However, Maas teaches a polymer that is a polyimide formed from the cyclodehydration of a polyamic acid obtained by reacting one tetracarboxylic dianhydride with a diamine that contains a heterocyclic ring (R_1 is a divalent radical containing at least one heterocyclic ring, column 4, lines 28-55), wherein the polymer is made into a photoconductive film (column 3, lines 9-10) that is rubbed by pressing across the film with a rubber squeegee, to remove air bubbles (column 3, lines 50-55, column 8, lines 30-35), for the purpose of forming a homogenous film.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have rubbed the polymer film of Kawada to remove air bubbles, in order to form a homogenous film, as taught by Maas.

Although Kawada in view of Maas fails to teach that the rubbed film is a liquid crystal alignment film that is capable of aligning a nematic liquid crystal, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, the rubbed polymer film of Kawada in view of Maas has, the same claimed structure and composition, and hence is expected to be capable of aligning a nematic liquid crystal, and thus function as a liquid crystal alignment film. See MPEP 2111.02.

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Regarding claims 6, 10, Kawada teaches that the diamine having a structure represented by formula (I) of Applicant, is 3,6-diaminocarbazole (column 6, lines 28-32).

Regarding claims 11-12, Kawada teaches that the diamine represented by formula (I) of Applicant, may be combined with other diamines (the repeating unit may be other than that represented by the general formula (I), including polyimides which have a carbazole moiety introduced therein, column 3, lines 40-57) to form the photoconductive polymer film (column 3, lines 1, lines 5-10). Kawada fails to disclose that the other diamines include aromatic diamines, such as p-phenylenediamine, m-phenylenediamine, 3,3'-dimethyl-4,4'-diaminobiphenyl, diaminobiphenylmethane, diaminodiphenylether, diaminodiphenylsulfone, diaminobenzophenone.

However, Maas teaches that the photoconductive polymer film (polyimides, column 6, lines 29-36) can be formed from a mixture of diamines (mixtures thereof, column 5, lines 49-50), which include aromatic diamines, such as p-phenylenediamine, m-phenylenediamine, 3,3'-dimethyl-4,4'-diaminobiphenyl, diaminobiphenylmethane, diaminodiphenylether, diaminodiphenylsulfone, diaminobenzophenone (column 5, lines 33-35), for the purpose of providing the photoconductive polymer film with the desired combination of physical properties.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have combined the diamine represented by formula (I) of Applicant, with aromatic diamines, such as p-phenylenediamine, m-phenylenediamine, 3,3'-dimethyl-4,4'-diaminobiphenyl,

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diaminobiphenylmethane, diaminodiphenylether, diaminodiphenylsulfone, diaminobenzophenone, to form the photoconductive polymer film of Kawada, in order to obtain the desired combination of physical properties, as taught by Maas.

Regarding claim 13, for the purposes of examination, the recitation of "wherein the diamine is selected from the group consisting of a diamine having an alkyl group, an fluoroalkyl group, a steroid skeleton or a combination thereof in its side chain", is interpreted to mean that the diamine of formula (I) of Applicant, is combined with a second diamine which meets said recitation. Kawada teaches that the diamine represented by formula (I) of Applicant, may be combined with other diamines (the repeating unit may be other than that represented by the general formula (I), including polyimides which have a carbazole moiety introduced therein, column 3, lines 40-57) to form the photoconductive polymer film (column 3, lines 1, lines 5-10). Kawada fails to teach that the other diamine is selected from the group consisting of a diamine having an alkyl group in its side chain.

However, Maas teaches that the photoconductive polymer film (polyimides, column 6, lines 29-36) can be formed from a mixture of diamines (mixtures thereof, column 5, lines 49-50), which include aromatic diamines, such as 3,3'-dimethyl-4,4'-diaminobiphenyl (column 5, lines 33-35), which has an alkyl group, specifically, methyl, in its side chain, for the purpose of providing the photoconductive polymer film with the desired combination of physical properties.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have combined the diamine represented by formula (I)

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of Applicant, with a diamine having an alkyl group in its side chain, to form the photoconductive polymer film of Kawada, in order to obtain the desired combination of physical properties, as taught by Maas.

Regarding claims 14-15, Kawada teaches that the proportion of the tetracarboxylic dianhydride represented by formula (II) of Applicant, based on all tetracarboxylic dianhydrides to be used for the specific polymer, is 100 mol% of the dianhydride of 1,2,3,4-cyclopentane tetracarboxylic acid (Example 7, cyclopentanetetracarboxylic anhydride, column 7, lines 50-65).

Regarding claim 17, Kawada teaches that the polymer film has a thickness of 48 nm (column 9, lines 18-25), which is within the claimed range of from 5 to 300 nm.

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawada in view of Maas as applied to claims 5-7, 10-15, 17 above, and further in view of Lin (US 2002/0107405).

Kawada in view of Maas teaches the rubbed film capable of aligning a nematic liquid crystal, and hence functioning as a rubbed liquid crystal alignment film, comprising at least one polymer selected from the group consisting of (i) a polyamic acid obtained by reacting one or more tetracarboxylic dianhydrides with one or more diamines comprising at least one diamine having a structure represented by Applicant's formula (I), and (ii) a polyimide obtained by cyclodehydration of said polyamic acid, as discussed above. Kawada in view of Maas fails to teach that the hydrogen atom at position X of the diaminocarbazole represented by Applicant's formula (I), can be substituted by a monovalent organic group such as a phenyl group.

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However, Lin teaches that the hydrogen atom at position X of the diaminocarbazole represented by Applicant's formula (I) can be substituted for the purpose of improving thermal stability (substituted carbazoles, column 2a, [0016]), such as with a phenyl group (substituted carbazole compounds of formula (I), column 1a, [0005], R¹ can be phenyl, column 1b, [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have substituted the hydrogen at position X of the diaminocarbazole reactant for the polymer film of Kawada in view of Maas, represented by Applicant's formula (I), with a monovalent organic group such as a phenyl group, in order to improve the thermal stability of the film, as taught by Lin.

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawada in view of Maas as applied to claims 5-7, 10-15, 17 above, and further in view of Nakayama (US 5,414,126).

Kawada in view of Maas teaches the rubbed film capable of aligning a nematic liquid crystal, and hence functioning as a rubbed liquid crystal alignment film, comprising at least one polymer selected from the group consisting of (i) a polyamic acid obtained by reacting one or more tetracarboxylic dianhydrides with one or more diamines comprising at least one diamine having a structure represented by Applicant's formula (I), and (ii) a polyimide obtained by cyclodehydration of said polyamic acid, as discussed above. In addition, Kawada teaches that the polymer film is formed on a substrate that is treated with a silane coupling agent to increase adhesivity of the

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substrate to the polymer film (for hydrophobicity, column 9, lines 18-25). Kawada in view of Maas fails to teach that silane coupling agent is comprised by the polymer film.

However, Nakayama teaches that a polymer film can further comprise a silane coupling agent for the purpose of increasing the adhesivity of the film to the substrate (column 18, lines 32-40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added the silane coupling agent on the substrate, to the polymer film on the substrate of Kawada in view of Maas, in order to increase the adhesivity the polymer film to the substrate, as taught by Nakayama.

Response to Arguments

15. Applicant's arguments regarding the valid use of Kawada as a primary reference have been fully considered but they are not persuasive.

16. Applicant argues that Kawada fails to disclose or suggest a liquid crystal alignment treating agent to obtain an alignment film for nematic liquid crystal, and is thus not anticipatory.

Applicant is respectfully reminded that the recitation of " a liquid crystal alignment treating agent to obtain an alignment film for nematic liquid crystal by rubbing treatment after forming a coating film" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for

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completeness but, instead, the structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). See MPEP 2111.02. In the instant case, the polymer of Kawada is formed from the same chemical components which have the same structural limitations claimed by Applicant, and thus is capable of performing the same functions. Both the alignment film formed by rubbing treatment of a coating film formed from the composition comprising the polymer, and the nematic liquid crystal, are not positively recited in claims 1-3, in contrast to being positively recited in claim 4.

17. Applicant's arguments, see page 12 of the remarks, filed 04/25/07, with respect to the valid use of Kawada in view of Matsuo, to reject the limitations of claim 4, have been fully considered and are persuasive. The 35 U.S.C. 103(a) rejection of claim 4 over Kawada in view of Matsuo, has been withdrawn.

Conclusion

18. Applicant's amendment adding new claims 5-15, and Applicant's submission of a letter with an English translation of the corresponding People's Republic of China Office action, which points out a compound in text form, present in JP 6-202118 that was submitted in an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on March 24, 2005, prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See

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MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye, can be reached at (571)272-3186. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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S. Hon
Sow-Fun Hon

07/23/07

[Signature]
RENA DYE
SUPERVISORY PATENT EXAMINER
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